MINERALOGICAL ABSTRACTS

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Notices of Books.

ERSON (B. W.). *Gem testing for jewellers.* London (Heywood & Co.), 1942, 194 pp., 1 pl., 43 text-figs. Price 7*s.* 6*d.*

his book is a reprint of a series of articles 'Some simple scientific tests for stones', nos. I–XXIV, which appeared in the 'Gemmological News' from to 1942 [M.A. 8–123]. The result is a good deal of repetition. Owing to ients of colouring, incongruous minerals and manufactured and imitation erials are brought together and compared, and useful hints are given of means distinguishing between them when deprived of some of their external charac- During his extensive practical experience in the jewellery trade the author made many careful determinations of optical and density data on stones of quality, and many of these are given in the book. Importance is attached absorption spectra, of which new records are also given. Good photomicro- phs of inclusions illustrate the distinction between natural and artificial stones. re are many interesting observations; e.g. the pyroelectric tourmaline collects ch dust in lighted show cases. L. J. S.

NG (L. C.). *South African scenery: a textbook of geomorphology.* Edinburgh and London (Oliver & Boyd), 1942, xxiv+340 pp., 1 map, 144 pls., 64 text-figs. Price 25*s.*

This is still another recent text-book on geomorphology [M.A. 7–416, 8–186]. very good idea of the varied scenery of South Africa can be gained by glancing er the 307 figures in the present well-illustrated volume. These include excel- t photographs (many of them taken by the author) supplemented by outline tches and block diagrams. In addition to those from South Africa, there are o many of his photographs from central Africa (including good views of the canic areas of Belgian Congo and Uganda) and New Zealand. The author is turer in geology and geography in Natal University College at Pietermaritz- rg and was previously demonstrator in geology in Victoria University College Wellington, New Zealand. In a well-arranged series of 21 chapters the subject dealt with from various geological points of view. The effects of different types rocks and geological structures are considered. The text is well and clearly itten; and the printing, paper, and binding show no indication of war-time strictions. L. J. S.

New Minerals.

URLBUT (C. S. *Jr.*). *Sampleite, a new mineral from Chuquicamata, Chile.* Amer. Min., 1942, vol. 27, pp. 586–589, 1 fig.

This occurs as blue crusts with gypsum, atacamite, limonite, &c., in crevices altered quartz-monzonite. The orthorhombic crystals are minute plates ttened on *b*(010) with the forms *c*(001), *m*(110), *d*(150), *r*(021), *p*(111); perfect arly cleavage (010) and good cleavages (100) and (001). Sp. gr. 3·20, H. 4,

$\alpha(=b)$ 1·629, $\beta(=a)$ 1·677, $\gamma(=c)$ 1·679, 2V 5–20°, negative. The unit c
a 9·70, *b* 38·40, *c* 9·65 Å. ($a:b:c$ = 0·2526:1:0·2513), contains eight molec
$NaCaCu_5(PO_4)_4Cl.5H_2O$. Analysis by F. A. Gonyer gave P_2O_5 31·55, Cl 3
CuO 43·37, MgO 0·51, CaO 5·73, Na_2O 3·06, K_2O 1·47, H_2O 9·57, insol. 1
total (less O for Cl_2) '99·78'. L. J. S.

Richmond (Wallace E.) & Fleischer (Michael). *Cryptomelane, a new name the commonest of the "psilomelane" minerals.* Amer. Min., 1942, vol. pp. 607–610.

Psilomelane [Min. Mag. **24**–522] is hydrous Ba-Mn manganate, while the m common cryptomelane (hitherto included, together with other minerals, und psilomelane) is K-Mn manganate and gives a distinctive X-ray pattern. Fo detailed analyses of the latter show MnO_2 81·75–87·09, MnO 2·08–3·92, K 3·10–3·88, BaO 0–1·04 %, &c. Water is variable in amount (H_2O+ 1·62–3·8 and is regarded as not essential, as the dehydrated mineral shows the sa X-ray pattern. The mineral may be fine-grained, cleavable, or fibrous, a resembles psilomelane in appearance. The body-centred tetragonal cell has, material from Tombstone, Arizona, *a* 9·82, *c* 2·83, and is isostructural wi hollandite and coronadite. [M.A. **5**–180, **8**–289.] L. J. S.

Ramsdell (Lewis S.). *The unit cell of cryptomelane.* Amer. Min., 1942, vol. 2 pp. 611–613.

The author had previously distinguished by X-ray methods three types psilomelane [M.A. **5**–180]: 'true' psilomelane containing no barium, which is t most common type; psilomelane containing barium, e.g. from Romanèch France; and lithiophorite. The first of these has now been called cryptomelan [preceding abstract]. Material from Nassau, Germany, is body-centred tetragon with *a* 9·82, *c* 2·86 Å. L. J. S.

Kerr (Paul F.). *Tungsten-bearing manganese deposit at Golconda, Nevada.* Bul Geol. Soc. Amer., 1940, vol. 51, pp. 1359–1389, 5 pls., 6 text-figs.

Limonite with absorbed tungstic oxide, tungsten-bearing psilomelane (WO 1·54–2·78 %) for which the name *tungomelane* is suggested, and tungsten-bearin hollandite occur in flat-lying blanket masses underlying calcareous tufa, jus above the former high-water level of the Quaternary Lake Lahontan. Both th ores and the tufa are believed to be of hot spring origin, tungstic acid havin been absorbed in psilomelane and limonite when these were gels. A vein in dicative of a lower level of mineralization contains tungsten-bearing jarosite The deposits are sufficiently large and rich enough in tungsten to warran economic development. C. F. D.

Herzenberg (Roberto). *Hochschildita un nuevo mineral de estaño descubierto en Bolivia.* Fac. Nac. Ingen. Univ. Oruro, report of meeting of September 25, 1942, [Oruro, 1942], 4 pp.

Teallite from Ichucollo mine, Callipampa, is altered to a yellow, earthy to scaly material with admixed cerussite and limonite. This is optically isotropic

high n and sp. gr. 4·45–4·59. It is soluble in HCl or caustic alkali leaving all residue of cassiterite ('needle-tin') and quartz. Analysis gave SnO_2 47·75, 28·6, Fe_2O_3 8·05, SiO_2 4·37, H_2O 11·23 = 100 (after deducting S 0·7, Sb 0·2, ·043 %), corresponding to $5SnO_2.2PbO.Fe_2O_3.SiO_2.10H_2O$. This new mineral, ed hochschildite, is essentially a hydrous lead stannate $PbSnO_3.5–6H_2O$, ogous to bindheimite. L. J. S.

ON (Brian). *Minerals of the Varuträsk pegmatite. XXVI. Mangan-hydroxyite.* Geol. För. Förh. Stockholm, 1941, vol. 63, pp. 279–284.

s a white massive mineral this occurs in veinlets in nodules of varulite [M.A. 30]. Analysis by T. Berggren gave P_2O_5 40·26, FeO 3·07, MnO 7·50, CaO 4, SrO 0·18, Na_2O 0·58, Li_2O trace, H_2O+ 2·56, H_2O- 0·31, insol. 0·49, , F, Cl, CO_2, SO_3 nil, total 99·09, corresponding with $Ca_{3·4}Mn_{1·1}Fe_{0·5}(PO_4)_6$ $)_2$. The following data are compared with those of allied minerals.

	Sp. gr.	ω.	ϵ.	a.	c.	c/a.
Mn-hydroxyapatite ...	3·19	1·661	1·657	9·54	6·73	0·705
Manganapatite	3·22	1·6459	1·6411	9·35	6·83	0·731
Hydroxyapatite ...	3·067	1·6452	1·6413	9·42	6·935	0·736
Fluorapatite	3·176	1·634	1·630	9·36	6·88	0·735

. from Varuträsk [M.A. **7**–10]; III, from Switzerland [M.A. **7**–106]; IV, from Ontario . **5**–480, **7**–88].

L. J. S.

MAN (Olof H.). *Geology and ores of the Boliden deposit, Sweden.* Årsbok Sveriges Geol. Undersökning, 1941, vol. 35, no. 1 (= Acad. Diss. Univ. Stockholm), 190 pp., 48 pls., 28 text-figs.

he important ore deposit of Boliden in Västerbotten, northern Sweden, is ated in a pre-Cambrian province of quartz-porphyries, tuffs, and agglomerates, n intercalations of dacitic, andesitic, and keratophyric lavas. Bordering the -bodies the country-rocks are altered to sericite-rock (±quartz) and andalusite-k. 56 new analyses of rocks, ores, and minerals are given, and 61 mineral cies have been found in the mine. The earliest ore-bodies, formed by displace-nt, are rich in mispickel, locally with rutile-rock, pyrite-apatite-rock, and rtz-plagioclase veins, which are believed to be differentiates of the original solution. Deposition of subsequent ores, especially bismuth, tetradymite, urobismuthite, and other bismuth tellurides, accompanied the intrusion of prophyre dikes and bodies of quartz-tourmaline-rock. The final stage of eralization is characterized by the entrance of pyrite-rich ore assemblages. visional names '*selenocosalite*' and '*selenokobellite*' are applied to selenium-a cosalite, $Pb_2Bi_2(S,Se)_5$ (Se 6·43 %), and kobellite, $Pb_2(Bi,Sb)_2(S,Se)_5$ (Se 3–5·74 %). Apophyllite, sp. gr. 2·361, from fissures in pyrite ore, analysed by Berggren, gives SiO_2 51·90, CaO 25·24, Na_2O 0·53, K_2O 4·69, H_2O+ 16·53, $O-$ 0·14, F 1·70 = (less O for F_2) 100·03. Bright green mariposite, colourless section, 2V 38–45·5°, negative, gives Cr_2O_3 0·54, K_2O 8·17, Na_2O 1·96, Li_2O ce, V nil. The mineralization is attributed to the Revsund granite (late haean), which outcrops to the south of the mine. C. F. D.

Löfquist (Helge) & Benedicks (Carl). *Det stora Nordenskiöldska järnblo från Ovifak, dess mikrografi och metallurgi.* Jernkontorets Annaler, Sto holm, 1940, vol. 124, pp. 633–685, 36 figs. (Swedish with German summa pp. 680–684.)

Löfquist (H.) & Benedicks (C.). *Det stora Nordenskiöldska järnblocket f Ovifak: mikrostruktur och bildningssätt.* K. Svenska Vetenskapsakad. Han 1941, ser. 3, vol. 19, no. 3, 96 pp., 2 pls., 58 text-figs. (English summa pp. 89–93.)

The 25-ton mass of native iron brought by Nordenskiöld from Ovifak, Gre land [Min. Mag. **1**–143; **6**–1, 14], stands in the open outside the Natural Hist Museum at Stockholm. Specimens that have been kept inside have fallen fragments, due to the formation of drying cracks in iron hydroxide and electrolytic action between iron and iron sulphide. The mass has been bo through and analyses of material from different points along the 188·5 cm. c show little variation, except rather more water in the outer portion: the me of five analyses is Fe 91·61, Ni 1·81, C 3·62, S 1·09, O 1·35, H 0·053, N 0·07 = 99 (H_2O 0·478, calculated from H). This resembles a cast iron rich in C and S. T granular structure is also uniform throughout the core. The main constitue are ferrite, cementite, and pearlite, with some troilite and pentlandite and r schreibersite; secondary are oxide-pearlite [Min. Mag. **24**–620], bravoite, nifesi goethite, and hisingerite (?). *Nifesite* is a Ni-Fe sulphide consisting of a ve fine-grained aggregate of grey bravoite and pale yellow pentlandite, and see ingly a low-temperature decomposition structure. It was also found in lar blocks of pyrrhotine from near Ovifak; these contain Ni 3·67–4·13 % and sh films of pentlandite parallel to the base and the prism, to which are due t cleavage and yellowish colour. It is suggested that the native iron was form from blocks of pyrrhotine by the heat from basaltic magma which had pass through beds of coal. A similar structure was produced artificially by melti FeS in a graphite crucible at 1500° C. [M.A. **6**–191.] L. J. S.

Barrett (Richard L.) & McCaughey (William J.). *The system CaO-SiO_2-P_2O* Amer. Min., 1942, vol. 27, pp. 680–695, 6 figs.

Mixtures of SiO_2, $Ca_2P_2O_7$, and $CaCO_3$ were fused in various proportions, an some slags were also examined. The results have a bearing on phosphate fert lizers. The equilibrium diagram shows a large region of two immiscible liqui in equilibrium with cristobalite. The solid phases form a binary system Ca_2SiO_4 $Ca_3P_2O_8$ with intermediate compounds *nagelschmidtite* $Ca_7Si_2P_2O_{16}$ first describe by G. Nagelschmidt [M.A. **7**–147] and silicocarnotite $Ca_5SiP_2O_{12}$ [Min. Mag. **19** 349], and between them there is extensive solid solution, suggesting substitutio of PO_4 by SiO_4 groups. The X-ray patterns show a certain similarity, an refractive indices decrease with increase of P_2O_5. L. J. S.

Rock-forming Minerals and Petrology.

Weber (Alfred). *Die Feldspate in den Gesteinen der Hochalm-Ankogel-Grupp* Min. Petr. Mitt. (Tschermak), 1941, vol. 53, pp. 1–23, 1 fig.

The plagioclases (determined on the universal microscope stage) of graniti

...s (granite, syenite, diorite) contain 2–28 % An; metabasites 0–100 %, and ...schists 2–23 %. Potash-felspars include orthoclase and microcline.

L. J. S.

...HLER (Alexander). *Die Abhängigkeit der Plagioklasoptik vom vorangegangenen Wärmeverhalten. (Die Existenz einer Hoch- und Tieftemperaturoptik.)* Min. Petr. Mitt. (Tschermak), 1941, vol. 53, pp. 24–49, 3 figs.

...easurements on the universal microscope stage of the optical orientation ...n reference to the pole of (010) of andesine and labradorite in volcanic rocks ...n Linosa do not agree with the usual curves, which are based on data deter...ed on plagioclases from crystalline schists, pegmatites, and plutonic rocks. ...radorite from Gorodischte, Russia, after heating for several hours at 950° C. ...ered some change in the optical orientation. It is therefore necessary to ...inguish between high-temperature and low-temperature plagioclases. [M.A. ...8; Min. Mag. **24**–343.] L. J. S.

...TSCH (H.). *Die optische Orientierung des Hochtemperatur-Anorthites.* Min. Petr. Mitt. (Tschermak), 1941, vol. 53, pp. 50–66, 4 figs.

...he optical orientation of artificial anorthite differs from that of anorthite ...n Vesuvius (where it occurs as crystals in crevices), but agrees with that of ...igh-temperature anorthite, which occurs as crystals ejected from the volcano ...Miyake island, Japan. Graphical methods are given for the determination of ...inction-angles from measurements on the universal microscope stage.

L. J. S.

...HLER (Alexander). *Drehtischmessungen an Plagioklaszwillingen von Tief- und Hochtemperaturoptik.* Min. Petr. Mitt. (Tschermak), 1942, vol. 53, pp. 159–179, 3 figs.

...urther measurements on low- and high-temperature plagioclases confirm pre...us results, and suggest that the data may indicate the genesis of the rocks.

L. J. S.

...HOLLER (Hubert). *Versuche zur Temperaturabhängigkeit der Plagioklasoptik.* Min. Petr. Mitt. (Tschermak), 1942, vol. 53, pp. 180–221, 3 figs.

...easurements of the optical orientation and of the optic axial angle are given ...32 plagioclases (albite to anorthite) both before and after heating for several ...urs at temperatures up to 1350°. The differences noted are not due to loss of ...ali on heating. L. J. S.

...RTSCH (H.). *Zur Hochtemperatur-Optik der Plagioklase.* Zentralblatt Min., Abt. A, 1942, pp. 137–144, 2 figs.

...urves give the positions of the A and B optic axes (with reference to the ...ectrices α and γ) from Ab to An and show the 'crossing of the optic axial ...ne' in the different types of twinning (albite, Carlsbad, albite-Carlsbad, and ...icline). Another set of curves shows the positions of (010), (001), [001], and [001] in (010) from Ab to An. In both cases the curves from high-temperature ...gioclases deviate somewhat from those for low-temperature plagioclases.

L. J. S.

Weber (Alfred). *Die Angel'sche Plagioklasuhr.* Zentralblatt Min., Abt. A., 19
pp. 90–96, 3 figs.

The 'plagioclase clock' described was devised by F. Angel and has beer
use by students in the University of Graz for 15 years. There are four 'har
to the clock, which are the traces of the albite and pericline lamellae, on a c
posite idealized section of an albite-pericline twin, drawn on a card which
be rotated about the centre of the clock dial. The 'dial' consists of four quadra
opposite pairs of which have the same graduations written clockwise on
quadrant and counter-clockwise on the opposite one. All four quadrants
divided into ten parts representing 0–100 % of anorthite, and between these
marked the extinction-angles corresponding to their percentage compositic
One pair of quadrants reads the extinction-angles measured from the trace
(001) on sections $\perp PM$; the other pair extinction-angles measured from
trace of (010) on either sections $\perp PM$ or $\perp \alpha$. An observation of the posit
of the acute angle between the traces of $P(001)$ and $M(010)$ decides which one
either pair of quadrants and which reference point on the rotating section is
be used. Determination of the extinction-angle in sign and magnitude th
enables the An % to be read off on the correct quadrant of the clock.

W. C. S.

Parrish (William). *Notation for chemical formulae of the plagioclase feldspa*
Proc. Pennsylvania Acad. Sci., 1941, vol. 15, pp. 102–106, 2 figs.

Atomic formulae are preferable to molecular formulae: $NaAlSi_3O_8$ rather th
$Na_2O.Al_2O_3.6SiO_2$ for albite, and $CaAl_2Si_2O_8$ rather than $CaO.Al_2O_3.2SiO_2$
anorthite. A general formula is $(Na_x,Ca_{1-x})(Si_x,Al_{1-x})AlSi_2O_8$, where $x = 1$
albite and $x = 0$ for anorthite. The composition of mixed crystals should r
be reprinted as end-members: e.g. $(Mg,Ca)_2SiO_4$ rather than $Mg_2SiO_4 + Ca_2SiO$

L. J. S.

Burri (Conrad). *Zur optischen Bestimmung der orthorhombischen Pyroxe*
Schweiz. Min. Petr. Mitt., 1941, vol. 21, pp. 177–182, 2 figs.

The $FeSiO_3$ content in orthorhombic pyroxenes can be deduced from α' a
γ determined on cleavage fragments by the immersion method. A formula
given for calculating α' from α and β and the cleavage angle. Optical data f
analysed material collected from the literature are tabulated and plotted; FeSi
0·5–83·7 mol. %, α' 1·659–1·755, γ 1·667–1·768. [Min. Mag. **24**–165, 221.]

L. J. S.

Yakovleva (M. E.). Яковлева (М. Е.). *On an amphibole of a variable compo*
tion from region of the Cheliabinsk granite massif. Compt. Rend. (Doklad
Acad. Sci. URSS, 1941, vol. 31, pp. 794–796, 1 fig.

The amphibole varies from colourless actinolite to dark bluish-green; optic
data are given for nine specimens (three analysed); the correlation of iron conte
and optical properties is considered.

M. H. H.

Naidu (P. R. J.). *On the occurrence of pargasite in Mysore.* Current Sci. Bang
lore, 1942, vol. 11, pp. 192–193.

A blue amphibole from an ultra-basic rock in Mysore [M.A. **8**–160] h

= +18°, $\gamma-\alpha$ 0·021, 2V 64°, negative, and pleochroism α yellow, β greenish-ow, γ indigo-blue; analysis by M. S. Iyengar gave SiO_2 46·89, Al_2O_3 11·86, O_3 1·96, FeO 12·08, MgO 11·91, CaO 10·81, Na_2O 3·05, K_2O 0·15, H_2O 0·70 99·41]. The calculated molecular composition shows 15 % of the glaucophane ecule to which the intense pleochroism is attributed. The mineral is com-ed with the pargasite from Finland 'rather than with hornblende'.

L. J. S.

E (W. T.). *Certain biotite gneisses of the Grenville series near Kingston, Ontario.* Trans. Roy. Soc. Canada, 1940, vol. 34, sect. 4, pp. 53–62.

Four chemical analyses are given of biotite-gneisses of metamorphic origin n sediments. I from Round Lake, and II of the biotite isolated from this rock.

	SiO_2.	TiO_2.	Al_2O_3.	Fe_2O_3.	FeO.	MnO.	MgO.	CaO.	Na_2O.	K_2O.	P_2O_5.	H_2O.	Total.
	55·34	0·24	17·14	2·06	4·40	0·04	4·78	3·68	2·18	9·25	0·01	1·05	100·17
	39·86	3·14	13·90	3·03	10·78	0·07	12·49	2·44	2·38	7·76	0·05	3·88	99·78

L. J. S.

KER (George). *Apatite crystals with colored cores in Victorian granitic rocks.* Amer. Min., 1941, vol. 26, pp. 382–390, 2 figs.

Small crystals of apatite in granites, adamellite, and granodiorites occasionally ntain coloured cores showing pleochroism. In a few cases the enclosed mineral n be identified as hornblende, biotite, and chlorite, but often the material of e cloud of dusty inclusions cannot be determined. The pleochroic effect in ades of blue and brown in the latter case appears to be due to the reflection d transmission of light by minute particles. These apatites are characteristic contaminated rocks, and the cores are no doubt remnants of ferromagnesian nerals around which the apatite crystallized. A map shows the distribution granitic rocks in Victoria. [M.A. 4–133; Min. Mag. 22–92.] L. J. S.

LER (S. A.), MARSDEN (R. W.), GROUT (F. F.), & THIEL (G. A.). *Studies of the Lake Superior pre-Cambrian by accessory-mineral methods.* Bull. Geol. Soc. Amer., 1940, vol. 51, pp. 1429–1537, 4 pls., 20 text-figs.

The heavy and accessory minerals of some hundreds of pre-Cambrian rocks om Wisconsin, northern Michigan, and Minnesota were examined. Early pre-uronian rocks, principally granites and granite-gneisses, commonly contain acinth (the purple zircon of Mackie and Boswell [Min. Mag. 21–310]), while te pre-Huronian and Huronian intrusives carry colourless to dirty-yellow alacon. The zircon of Keweenawan igneous rocks is a colourless to pale yellow-own normal variety. The differences in these three types of zircon suggest portant correlations of certain granite masses of hitherto doubtful age, and derived pre-Cambrian sediments; but ratios of other heavy minerals have oved of little value in correlation. The changes in heavy minerals due to eathering and sedimentation are discussed, with conclusions on relative stability species at variance with those of some previous investigators. [M.A. 8–123, 37.]

C. F. D.

[Visnevsky (Y. S.)] Висьневский (Я. С.). Visnevsky (J. S.). *On the phe mena of regeneration in rocks.* Compt. Rend. (Doklady) Acad. Sci. UR 1941, vol. 31, pp. 797–798, 1 fig.

Regeneration, that is, the restoration of the original or a closely related mine in place of a secondary mineral, often in the original crystallographic orientati is probably much more widespread than has been generally supposed.

M. H. H

Coombs (Howard A.). *Expansion of concrete due to reaction between andes aggregate and cement.* Amer. Journ. Sci., 1942, vol. 240, pp. 288–297, 2 f

Fragments of andesite in a high-alkali cement develop rims of gelatinous sil (or sodium silicate), which are shown up in ultra-violet light or by staining w aniline dyes. Other rocks showing the same reaction are rhyolite, shale, phylli opaline chert, and siliceous magnesian limestone. L. J. S.

Richey (J. E.). *The dykes of Scotland.* Trans. Edinburgh Geol. Soc., 19 vol. 13, pp. 393–435, 6 figs.

A summary of the extensive published literature on the dikes of Scotlan The paper concludes with general inferences on the downward and upwa extension of dikes, the parallelism between dikes and tectonic lines of the sar general age, dike-echelons, and the origin of dike-fissures. C. F. D.

Tomkeieff (S. I.). *The Tertiary lavas of Rum.* Geol. Mag. Hertford, 1942, vol. 7 pp. 1–13, 2 figs.

The Tertiary lavas of Rum (Hebrides) comprise (*a*) olivine-dolerites an olivine-basalts, (*b*) trachybasalts including mugearites. Amygdaloidal modific tions of the trachybasalts yield various forms of cryptocrystalline silica (especiall prase, an analysis of which is given), quartz, chlorophaeite, celadonite, and iro rich carbonate. It is suggested that the amygdaloidal rocks are solidified macr emulsions, possibly of immiscible 'dry' and 'wet' fractions, the 'wet' fractio having given rise to the gel chalcedony and chlorophaeite of the vesicles.

C. F. D.

Cheng (Y. C.). *A hornblendic complex, including appinitic types, in the migmati area of north Sutherland, Scotland.* Proc. Geol. Assoc. London, 1942, vol. 5 pp. 67–85, 1 pl., 7 text-figs.

Unmigmatitized rocks of the 'hornblendic complex' of Bettyhill on the nort coast of Sutherland consist principally of pyroxenites, hornblendites, hornblende pyroxene-biotite-schists, and coarse appinites, all intruded into the Moine Serie prior to the period of granitic injection. By a complex series of replacement during migmatitization, pyroxene, hornblende, and, in part, biotite are eliminate from these rocks and quartz, oligoclase, and orthoclase become abundant, result ing in the formation of late appinites, hornblendic migmatites of dioritic aspect hornblendic gneisses with orthoclase augen, and streaky granite-gneisses. Appi nitic rocks of two types are distinguished, one group formed prior to, the othe during, the migmatitization. C. F. D.

YNOLDS (Doris L.). *The albite-schists of Antrim and their petrogenetic relationship to Caledonian orogenesis.* Proc. Roy. Irish Acad., Sect. B, 1942, vol. 48, no. 3, pp. 43–66, 6 figs.

he albite-schists which characterize the Ben Ledi and Pitlochry groups of Antrim Dalradian have originated from non-felspathized schists by a complex es of 'geochemical migrations', including early introduction of potash (posy also iron and magnesia) followed by introduction of soda and silica with placement of potash, iron, magnesia, and alumina. These impregnations are ted to Caledonian syntectonic igneous activity. Comparable examples of pathization during Caledonian orogeny are derived from Scottish and Scandian literature, and a general discussion of geochemical migration in orogenic s is appended. C. F. D.

DIUS (Nils). *Berggrunden inom sydöstra delen av Stockholms skärgård.—Rocks in the south-eastern part of the Stockholm archipelago.* Årsbok Sveriges Geol. Undersökning, 1939, vol. 32 (for 1938), no. 9, pp. 1–75 (Swedish), 76–93 (English summary), 23 figs.+geol. map.

he many islands in the south-east part of the Stockholm archipelago, 30 to km. from the town, are formed of leptites invaded by orthogneisses of the nposition of quartz-diorite (locally with microperthite augen 1–4 cm. across), nite, quartz-syenite, quartz-poor diorite (ornöite), greenstones (gabbros, hornde-picrites, and helsinkites), and a wide development of microcline- and gioclase-rich aplites and pegmatites. All these rocks are of early Archaean . Many display magnificent banded structure. Albite-aplites (albitites) on nö have been mined for ceramic use. The leptites, which bear intercalations limestone, may be supercrustal rocks of volcanic origin. The memoir lists merous new chemical analyses, and detailed excursion itineraries are included. C. F. D.

HMEER (Dora). *Gesetzmäßige Beziehungen im Mineralbestand endogener Einschlüsse und der Hüllgesteine im Böhmischen Mittelgebirge.* Min. Petr. Mitt. (Tschermak), 1940, vol. 52, pp. 1–76, 8 figs.

Detailed descriptions are given of the porphyritic crystals and of glomerophyritic and nodular aggregates (cognate or endogenous inclusions) of olivine, oxene, and hornblende in various types of volcanic rocks in the Midland Mts. Bohemia. Their conditions of crystallization and relations to the enclosing k are discussed. L. J. S.

CHELL (Wilson D.). *Paragenesis of the pegmatite minerals of Striegau, Silesia.* Amer. Min., 1941, vol. 26, pp. 262–275, 4 figs.

A description is given of a set of these minerals in the Harvard University lection. They occur in many druses, often of large size, in pegmatite lenses the Striegau granite. Five stages of mineralization are recognized: magmatic ge including graphic intergrowth of quartz and felspar surrounding the druses; itization stage with cleavelandite replacing orthoclase; pneumatolytic and drothermal stage with chlorite (strigovite, prochlorite, and pennine), tourline, fluorite, epidote, clinozoisite, axinite, &c., filling the druses; zeolite stage, eriod of cooling thermal solutions; and the final calcite stage. L. J. S.

Fenoglio (Massimo). *Studi geologico-petrografici sulla Val Nambrone (massic dell' Adamello).* Mem. Inst. Geol. Univ. Padova, 1938, vol. 13, [no. 3], 96 pp 1 map, 1 pl., 6 text-figs.

The plutonic rocks of this part of the Adamello massif include principal various tonalites and diorites, with dikes of granodiorite, aplite, quartz-biotit porphyrite, and lamprophyre (malchite and minette). Seventeen full rock analys are given. Small druses in the tonalite of Valle d'Amola contain epidote [M. 7–362] and in the Scarpacò valley large druses yield stilbite with the forn $b(010)$, $c(001)$, $m(110)$, $f(10\bar{1})$, and with sp. gr. 2·159, α 1·492, β 1·499, γ 1·5(2V 32° 25′, negative, SiO_2 55·21, Al_2O_3 16·91, Fe_2O_3 trace, CaO 8·10, MgO 0·2 Na_2O 1·16, K_2O 0·45, H_2O 18·27 = 100·35. C. F. D.

Holmes (Arthur). *A heteromorph of venanzite.* Geol. Mag. Hertford, 1942, vol. 7 pp. 225–232.

A rock specimen from Pian di Celle, San Venanzo, Umbria, Italy, differs fro the type venanzite (a lava consisting essentially of melilite, leucite, olivine, a a little phlogopite) in containing conspicuous amounts of augite and a nephelin like mineral. From the highly potassic nature of the rock (K_2O 7·45, Na 1·76 %) the latter mineral is believed to be kalsilite [Min. Mag. **26**–197, 21 The new rock-type, which is a kalsilite-augite-venanzite or mafurite-venanzit is a heteromorph of normal venanzite, pyroxene and kalsilite occurring in pla of part of the melilite and leucite of that rock. The relationships of mafurit venanzite to the ugandites, mafurites, and katungites of Uganda [M.A. **7**–3 are discussed, with chemical analyses. C. F. D.

[Polovinkina (Y. I.)] Половинкина (Ю. Ир.). Мигматиты западной окраин Криворожского месторождения („Ингулецкий гнейс").—Polovinkin (J.). *The migmatites of the western border of the Krivoi Rog iron ore fiel The Ingouletz gneiss.* Труды Цент. Науч.-Иссл. Геол.-Разв. Инст. (Tran Central Geol. Prosp. Inst.), 1939, no. 112, 76 pp., 3 pls., 36 text-fig (Russian with English summary.)

The Inguletz gneiss in the Ukraine is an injection complex with great vari tion in the types of migmatite present. The author, following the terminolo of Sederholm, distinguishes and describes in detail agmatites, arterites, nebulit arterites, nebulites, and nebulitic granites. Dikes of a pink 'spotted' aplit granite, with biotite clots, are compared to the contaminated granite of Dhoo Isle of Man [Min. Mag. **22**–494]. Ten chemical analyses of the principal roc types are given. C. F. D.

Tatarinov (P. M.) & Krasnovsky (G. M.) Татаринов (П. М.) и Красновски (Г. М.). Алапаевская интрузия ультраосновных пород на Урале и месторождения хромистого железняка. *Alapayevsk intrusion of ultra-bas rocks in the Urals and associated deposits of chromite.* Труды Цент. Науч Иссл. Геол.-Разв. Инст. (Trans. Centr. Geol. Prosp. Inst.), 1940, n 120, 140 pp., 3 pls., 40 text-figs.+geol. map. (Russian with English sun mary.) Price 4 r. 50 k.

The Alapaevsk intrusion, one of the largest ultrabasic masses of the Ural

ormed chiefly of harzburgite and harzburgite-serpentine, with masses of ite, wehrlite, and pyroxenite, and with schlieren, veins, and lenticles of zolite, websterite, diallagite, enstatitite, troctolite, gabbroic and dioritic ks, plagioclasite, and albitite. Assemblages with idocrase, garnet, titaniferous mblende, actinolite, tremolite, chlorite, &c., have arisen by metamorphism. re than 60 deposits of chrome-spinel (Al_2O_3 about 20 %, Cr_2O_3 40–43 %) occur enses in the harzburgite. Associated with the spinel, but of later paragenesis, chromium-tourmaline, fuchsite, chrome-diopside and diopside, chromium-rase and idocrase, rutile, perovskite, tremolite, chromium-chlorite, talc, cite, carbonates, and chrysotile-asbestos. The geological map (1:100,000) is ted in English and Russian. C. F. D.

RVINSKY (P. N.) & USHAKOVA (Z. G.). Чирвинский (П. Н.) и Ушакова (З. Г.). Кларки комплекса магматических пород Уральской геосинклинали и их генетический смысл.—*Clarkes of magmatic rocks complex in the Ural geosyncline and their genetic meaning.* Бюлл. Моск. Общ. Исп. Природы (Bull. Soc. Nat. Moscou), 1938, n. ser., vol. 46 (Sect. Géol. vol. 16), pp. 3–25. (Russian with English summary.)

The calculated average composition (clarkes) [M. A. 6–286, 337; 7–6, 32] of the eous rocks of the Urals is similar to the average for Great Britain. This erage recalculated into molecular percentages corresponds to the formula $MSiO_3$, in which M is the average metal. This average metal is given the name protoaluminium (atomic weight 27) and it is considered to be a pseudoelement, atever this may mean. The metasilicate of protoaluminium is called crusta-rium. Elaborate thermo-chemical calculations are given to illustrate the role ayed by protoaluminium and crustaterrium in the earth's crust and in the smos. [M.A. 2–84, 389.] S. I. T.

UCHITZKY (I. V.) & NAGIBINA (M. S.)] Лучицкий (И. В.) и Нагибина (М. С.). О молодых эффузивах Восточного Забайкалья.—LOUCHIZKY (J. V.) et NAGIBINA (M. S.). *Sur les jeunes effusions de la Transbaikalie orientale.* Бюлл. Моск. Общ. Исп. Природы (Bull. Soc. Nat. Moscou), 1938, n. ser., vol. 46 (Sect. Géol. vol. 16), pp. 26–35. (Russian with French summary.)

Lavas and dikes from Urov river (eastern Transbaikalia), probably of Quaternary age, are described in this paper. They are represented by dolerite, basalt, parite, and perlite. One chemical analysis of basalt and one of liparite are given. S. I. T.

HOSH (P. K.). *The charnockite series of Bastar State and western Jeypore.* Rec. Geol. Surv. India, 1941, vol. 75, Prof. Paper no. 15, 55+vii pp., 7 pls. Price *Rs.* 2–2 = 3*s.* 6*d.*

A typical series of ultrabasic, basic, and acid charnockites, sometimes garnetiferous, and associated eclogites, is discussed. The author claims that these rock-types have originated from impure (Fe- and Mg-rich) calcareous sediments by various processes of metasomatism and metamorphic differentiation. No chemical or optical data on the rocks or rock-forming minerals are adduced in support of his postulate. C. F. D.

Brouwer (H. A.). *Leucite rocks of the active volcano Batoe Tara (Malay archipelago).* Proc. Kon. Nederl. Akad. Wetenschap., 1939, vol. 42, pp. 23–29.

The older lavas of this active volcano consist predominantly of leucite-basanite and are cut by dikes of similar composition. The more recent eruptions are biotite-leucite-tephrite. Six chemical analyses are given. C. F. D.

Bemmelen (R. W. van). *De agmatitische graniet van Tandjoeng Binga (NW Billiton).* De Ingenieur in Nederlandsch-Indië, 1940, vol. 7, sect. 4, pp. 65–66, 2 pls. (Dutch with English summary.)

—— *Granitische intrusies in het zuidergebergte van west-Java.* Ibid., 1941, vol. 8, sect. 4, pp. 9–18, 2 pls., 7 text-figs. (Dutch with English summary.)

Various acid plutonic masses of supposed metasomatic derivation are described. In the first paper granite is derived from quartzite country-rocks acted on by alkali-alumina emanations, and also from lamprophyre—frequently found, surrounded by quartz-syenite, as xenoliths in the granite—by the accession of K_2O and SiO_2 and expulsion of cafemic oxides. In the second paper quartz-diorites and granodiorites intruding propylitized andesites are stated to have arisen by the action of sialic (SiO_2, Al_2O_3, alkalis) emanations on the country-rocks, from which cafemic components were driven outwards to form a lamprophyric contact facies. [M.A. **8**–33.] C. F. D.

Legoux (P.). *Le massif de Man (Côte d'Ivoire): essai de géologie pétrographique.* Bull. du Service des Mines, Gouvernement général de l'Afrique occidentale française, 1939, no. 3, 95 pp., geol. map, 6 pls., 24 text-figs.

The rocks described in this memoir are predominantly of a charnockitic cast. They include (1) a granitic series ranging from garnet-bearing aplogranites to hypersthene-granites or birkremites; (2) a noritic series comprising quartz-bearing anorthosites, quartz-norites, norites, and hypersthenites with olivine, spinel, and hornblende; (3) metamorphic pyroxenites grading into amphibolites, both with garnet; (4) miscellaneous magnetite-rich quartzites, quartz-garnet (almandine) rocks, and metamorphic hypersthenites; (5) injection rocks produced by the migmatitization of some of the above types. Many chemical analyses are given, and the complex is compared with the charnockite provinces of India and other lands. [M.A. **7**–190.] C. F. D.

Coetzee (C. B.). *Sillimanite-corundum rock: a metamorphosed bauxite in Namaqualand.* Trans. Roy. Soc. South Africa, 1940, vol. 28, pp. 199–205, 1 pl., 1 text-fig.

A sillimanite-corundum-rock outcropping on the Pella Mission Station gives on analysis SiO_2 26·01, TiO_2 5·55, Al_2O_3 66·30, Fe_2O_3 0·41, FeO 0·54, MnO 0·01, MgO 0·00, CaO 0·00, Na_2O+K_2O 0·09, H_2O+ 1·00, H_2O- 0·08 = 99·99. The mode is sillimanite 70·9, corundum 22·5, ilmenite 6·6. Sillimanite occurs as fine radiating brown tufts, α 1·654, β 1·659, γ 1·673, 2V 30°; corundum as colourless grains, ω 1·766, ϵ 1·761. Probably the rock represents a metamorphosed bauxite. [Min. Mag. **26**–134.] C. F. D.

WSER (A.). *A kimberlite occurrence in the Philipstown district.* Trans. Geol. Soc. South Africa, 1941, vol. 43 (for 1940), pp. 69–83, 1 pl., 6 figs.

pipe (150 × 100 yards) of kimberlite on the farm Lekkerfontein (30° 20′ S., 30′ E.) [100 miles south of Kimberley] carries inclusions of hornstone (in-ated shale), limestone, olivine-gabbro, norite, serpentinized peridotite, and red eclogite. The relations of kimberlite to melilite-basalt are discussed, with phs based on Niggli values. The pipe has been prospected but only a few ll diamonds have been found. C. F. D.

THIAS (Morna). *A comparative study of the Namaqualand granites.* Trans. Geol. Soc. South Africa, 1941, vol. 43 (for 1940), pp. 175–203, 1 fig.

mineralogical and petrological study of five granites in Namaqualand, with cial reference to their correlation with other South African granites. Chemical lyses are given of the rocks and optical data of the felspars and other minerals. C. F. D.

LSON (M. E.). *Noranda district, Quebec.* Mem. Geol. Surv. Canada, 1941, no. 229, vii + 148 pp., 14 pls., 3 text-figs., 5 maps (1 inch to 800 feet). Price 50 cents.

This detailed report with large geological maps in colour and photographs of nsual excellence, based on field work (1931–35) by the author and numerous istants, describes the geology and ore-deposits of an area of about 45 sq. miles ere ore was discovered in 1923 and copper and gold to the value of $43,000,000 re obtained in 1939. The area is occupied by Archaean volcanic rocks, in-ding siliceous rhyolite (analysis I, spherulitic micropegmatitic rhyolite, N. of Waite-Ackerman-Montgomery mine, Duprat township, Abitibi Co.), rhyolite W. of the Amulet mine, E. of Rusty Ridge, Duprat township), and andesite II, 1000 feet S. of Beaver Hill Geodetic Triangulation Station, Dufresnoy town-p). These were intruded by diorite, gabbro (IV, least altered pyroxene-gabbro, h labradorite An_{55} 50·3, pyroxene and amphibole 48·7, magnetite 1·0 %, SW. the outlet of Duprat creek, Dufresnoy township), granodiorite, and albite-nite (alaskite) (V, about 1100 feet E. of Rouyn-Beauchastel line and 2000 feet of Nipissing Central Railway, Rouyn township; VI, pit on range 2, lot 37, prat township). Analyses I–V by R. J. C. Fabry, VI by W. H. Herdsman. e ore-minerals are chalcopyrite, pyrrhotine, pyrite, magnetite; occasional cosa-e (M. H. Haycock), galena, blende, molybdenite, tetrahedrite; hessite, petzite, vanite, krennerite, calaverite, altaite (P. Price), tetradymite (E. Poitevin); ld and silver. Analyses of the copper anodes from the Horne smelter show undant Se. On cordierite from dalmatianite [M.A. 4–401] A. N. Winchell easured α 1·5458, β 1·5524, γ 1·5582 (Na), 2V 84–85°.

	SiO_2.	TiO_2.	Al_2O_3.	Fe_2O_3.	FeO.	MnO.	MgO.	CaO.
I.	85·11	0·25	7·97	0·36	0·98	trace	0·05	0·77
II.	78·78	0·28	11·21	1·04	2·77	trace	1·33	0·21
III.	54·02	1·63	15·67	2·38	8·46	0·01	4·12	7·14
IV.	51·75	1·15	17·47	2·96	9·16	trace	5·20	9·40
V.	74·89	0·22	13·27	0·36	3·65	trace	0·40	1·15
VI.	73·79	0·39	11·83	0·72	4·18	0·07	0·62	2·21

	Na_2O.	K_2O.	H_2O+.	H_2O-.	P_2O_5.	CO_2.	S.	Total.
I.	2·68	0·89	0·50	0·03	0·20	none	0·07	99·81[1]
II.	3·13	0·80	0·56	0·19	trace	0·22	0·02	100·53[2]
III.	4·84	0·64	0·77	0·04	0·44	none	0·09	100·18[3]
IV.	1·37	0·43	0·21	0·23	0·34	0·32	0·16	100·15
V.	4·25	0·37	1·22	0·03	trace	0·78	trace	100·59
VI.	3·94	0·85	0·90	0·40	0·09	none	trace	100·00[4]

[1] Less O for S 0·05. [2] Less O for S 0·01. [3] Less O for S 0·07.
[4] Incl. F 0·01 (W. C. Gussow).

M. A. P.

Satterly (J.). *Pillow lavas from the Dryden-Wabigoon area, Kenora distri Ontario.* Univ. Toronto Studies, Geol. Ser., 1941, no. 46, pp. 119–136, 7 fig

Well-developed and clearly illustrated pillow-structures in altered Keewat andesites and basalts are strikingly displayed on the glaciated shores and islan of Wabigoon Lake. Neither specific gravity measurements nor microscop examination serves definitely to identify the original rock types. Analyses, b the Provincial Assay Office, (I) of pillowed andesite, Islands No. 157–8, Wabigoo Lake, (II) pillowed augite-basalt, Brownridge township, Kenora district, ar (III) flinty black acid lava (dacite), Laval township, Kenora district, are com pared with previous analyses.

	SiO_2.	TiO_2.	Al_2O_3.	Cr_2O_3.	Fe_2O_3.	FeO.	MnO.	MgO.	CaO.
I.	58·59	0·95	16·94	0·03	1·50	5·09	0·23	5·17	6·38
II.	47·10	1·12	15·93	trace	3·43	7·06	0·39	7·40	12·04
III.	68·45	0·97	14·82	none	1·11	4·75	0·08	1·58	2·34

	Na_2O.	K_2O.	H_2O.	P_2O_5.	FeS_2.	CO_2.	Total.	Sp. gr.
I.	1·88	0·39	2·14	0·21	0·45	0·28	100·23	2·870
II.	2·98	0·44	1·09	0·01	none	1·21	100·20	3·021
III.	2·60	1·94	0·55	none	0·22	0·38	99·79	2·65

M. A. P.

Pettijohn (F. J.). *Archean metaconcretions of Thunder Lake, Ontario.* Bul Geol. Soc. Amer., 1940, vol. 51, pp. 1841–1850, 2 pls., 1 text-fig.

Archaean paragneisses at this locality contain nodules formed of basic plagic clase, quartz, and hornblende, with subordinate clinozoisite and grossular, whic are believed to represent calcareous concretions in the ancient sediments.

C. F. D.

Chayes (Felix). *Alkaline and carbonate intrusives near Bancroft, Ontario.* Bul Geol. Soc. Amer., 1942, vol. 53, pp. 449–511, 5 pls., 3 text-figs.

The alkalic rocks of the Bancroft area, comprising (*a*) a series of saturated o nearly saturated rocks ranging from syenite through shonkinite to perknite, an (*b*) an undersaturated group including urtite, ijolite, foyaite, and jacupirangite lie along the contact between Laurentian granite and Grenville marble. Lense of plagioclase-amphibolite within the granite have a marginal syenitic facies, an shonkinites have developed by mixing of the amphibolite and syenitic liquid

ses of nepheline-pegmatite or coarse urtite occur principally within limestone. re urtite intrudes amphibolite, ijolite and jacupirangite are formed; where enetrates syenite, foyaite results. The origin of the amphibolites, believed Adams and Barlow to be silicated limestones, is left an open question. The onate rocks associated with the igneous complex are of intrusive habit, but of the carbonate is truly magmatic and only a little hydrothermal—the bulk is a metamorphic derivative of Grenville limestone. Daly's limestone exis hypothesis is invoked in explanation of the petrogenesis of the alkalic s. C. F. D.

S (Ernst) & HIETANEN (Anna). *Geology of the "Martic overthrust" and the Glenarm Series in Pennsylvania and Maryland.* Special Paper Geol. Soc. Amer., 1941, no. 35, 207 pp., 28 pls., 58 text-figs.

lengthy structural and petrofabric study of the Glenarm Series leads to the usion that this series is not part of the pre-Cambrian basement complex of Appalachians, as frequently supposed, but is of Lower Cambrian and later The monograph includes much petrofabric and petrographical detail on the morphic rocks (principally limestones, dolomites, and albite-chlorite-schists ressing to chloritoid, garnet, staurolite, and kyanite-bearing types) but no eral analyses are given. C. F. D.

VARTZ (George M.) & SANDBERG (Adolph E.). *Rock series in diabase sills at Duluth, Minnesota.* Bull. Geol. Soc. Amer., 1940, vol. 51, pp. 1135–1171, 6 pls., 11 text-figs.

hree sills, respectively 1300, 1026, and 963 feet in maximum thickness, ide Keweenawan basalts and rhyolites. Each consists of diabase in the lower ion and granophyre near the top, these rock-types grading one into the other ugh a diabasic central zone with a varying content of micropegmatite. Many nical analyses are given. The differentiation was a complex process, aided cially by a concentration of mineralizers, carrying acidic and alkalic con- ents, in the upper parts of the intrusions. C. F. D.

HLSTROM (Ernest E.). *Audubon-Albion stock, Boulder County, Colorado.* Bull. Geol. Soc. Amer., 1940, vol. 51, pp. 1789–1820, 4 pls., 9 text-figs.

his composite intrusion, of Eocene age, penetrates pre-Cambrian granite, ss, and schist, and consists of syenogabbro (oldest), monzonite, quartz- zonite, syenite, and granite (youngest). The monzonite, present in greatest , probably formed from an initial syenogabbroic magma by crystal-fractiona- , but the later rocks have arisen by more complex processes, including not crystal-fractionation but also assimilation, syntexis, and transfer by mobile lic solutions. The mechanism of emplacement was probably of ring-fracture uldron-subsidence type. C. F. D.

HLSTROM (Ernest E.). *Hydrothermal deposits in the Specimen Mountain volcanics, Rocky Mountain National Park, Colorado.* Amer. Min., 1941, vol. 26, pp. 551–561, 9 figs.

eds of pitchstone and volcanic ash and agglomerate are traversed by brec-

ciated faults along which hot solutions have penetrated. The pitchstone ne these faults is altered to jasper with various forms of chalcedony and opal; a platy crystals of calcite, later replaced by chalcedony and opal. L. J. S.

Bray (Joseph M.). *Spectroscopic distribution of minor elements in igneous ro from Jamestown, Colorado.* Bull. Geol. Soc. Amer., 1942, vol. 53, pp. 76 814, 4 figs.

Representative specimens of three groups of pre-Cambrian granites, of differe ages, and Tertiary granodiorites, granites, and quartz-monzonites, all from t Jamestown district of Boulder Co., were analysed spectrographically to show t distribution of certain minor elements (especially Sc, Yt, La, Ce, Nd, Zr, V, C Co, Ni, Ag, Zn, Pb). Massachusetts rocks were examined for comparison. Ea rock type shows a distinctive minor element content, but the Colorado a Massachusetts provinces possess individual characteristics. Qualitative a quantitative examination of the rock-forming minerals shows that Sr is high in K and Ca minerals (especially felspar), Ba in K minerals (potash-felspar a hornblende), and Sc in Mg and Fe″ minerals (mica and hornblende). All qua and sphene contain Al, and sphene in addition contains appreciable rare-eart Ti, Mn, V, and Cr are concentrated in the dark minerals and muscovite, wh Ni and Co occur almost exclusively in biotite. Pegmatite minerals average l of almost every minor constituent than does the same mineral in the norm rock. C. F. D.

Larsen (Esper S.). *Petrographic province of central Montana.* Bull. Geol. S Amer., 1940, vol. 51, pp. 887–948, 21 figs.

A discussion, with many variation diagrams, of the differentiation of t Tertiary and Quaternary igneous masses along the eastern base of the Roc Mountains from the Yellowstone National Park to the Canadian border. T rocks of the province range from ordinary rhyolites, andesites, and basalts potash- and soda-rich types—shonkinites, nepheline-syenites, and syenites. D ferentiation is believed to have been in large proportion due to crystal-fractio tion, but assimilation of granitic material and processes of gaseous transfer a played a part. C. F. D.

Lonsdale (John T.). *Igneous rocks of the Terlingua-Solitario region, Texas.* Bu Geol. Soc. Amer., 1940, vol. 51, pp. 1539–1626, 7 pls., 8 text-figs.

This igneous sub-province consists of several hundred masses forming la flows, plugs or necks, dikes, sills, laccoliths, bysmaliths (?), and possibly stoc The rocks present comprise: (1) an analcime-free series of rhyolite and leu rhyolite rich in alkali-felspars, soda-rhyolite with aegirine, aegirine-augite, a riebeckite, trachyte, soda-trachyte, syenodiorite-trachyandesite, and basalt; a (2) a group rich in primary, deuteric, and hydrothermal analcime, includi syenite, syenodiorite, syenogabbro, trachybasalt, trachydolerite, teschenitic ga bro, and picritic basalt. Detailed petrographic descriptions and 21 chemi analyses are given. A tectonic control of differentiation is postulated.

C. F. D.

DONALD (Gordon A.). *Progressive metasomatism of serpentine in the Sierra Nevada of California.* Amer. Min., 1941, vol. 26, pp. 276–287, 3 figs.

odules of serpentine in mica-schist near intrusive quartz-diorite at Hum-ys have been altered by igneous emanations. Cores of residual serpentine surrounded by successive envelopes of talc, talc and actinolite, actinolite, cite, and biotite. Chemical and micrometric analyses show a loss of magnesia, tion of silica in the inner zones, and the addition of small amounts of other es in the outer zones. The occurrence is very similar to that of Unst, Shetland nds [Min. Mag. **23**–519]. L. J. S.

SB (Robert W.). *Quartz xenocrysts in olivine basalt from the southern Sierra Nevada of California.* Amer. Min., 1941, vol. 26, pp. 321–337, 7 figs.

nall isolated flows of olivine-basalt in the Kernville area contain abundant oliths of granodiorite (the underlying rock) in various stages of alteration and tion, and also small angular fragments and granular aggregates of quartz; latter are evidently remnants of the granodiorite. Rims (1–2 cm. wide) sur-ding the xenoliths show a development of clinopyroxene, spinel, and iron- and saninidization of the potash-felspar. Quartz grains are rimmed by clino-oxene. Radial tension cracks radiate from the xenoliths into the basalt.

L. J. S.

EUX (Lucien). *Rôle du carbonate de chaux et des phénomènes d'épigénie dans la genèse des minéraux non détritiques des roches sédimentaires.* Compt. Rend. Acad. Sci. Paris, 1941, vol. 212, pp. 736–739.

alcium carbonate, often in the form of organic remains, in sedimentary rocks be replaced by silica (quartz, chalcedony, opal), calcium phosphate, glauco-, iron ores, dolomite, pyrite, or gypsum. L. J. S.

RBAIRN (H. W.) & HAWKES (H. E., *Jr.*). *Dolomite orientation in deformed rocks.* Amer. Journ. Sci., 1941, vol. 239, pp. 617–632, 29 figs.

etrofabric diagrams of dolomite marble from Vermont, Montana, and Ontario w the *c*-axes to be perpendicular or inclined, never parallel, to the foliation he rock. Lamellar twinning in calcite is on $e(01\bar{1}2)$ with the slip direction ards the *c*-axis, while in dolomite it is on $f(02\bar{2}1)$ [M.A. **4**–239] and the slip ction is assumed to be away from the *c*-axis. In dolomite there is also perhaps sent a translation on (0001) in the direction $[(0001) : (10\bar{1}1)]$. In dolomite, y those grains having their *c*-axes approximately parallel to the stress deform translation and twinning; in calcite, twinning and translation develop only hose grains having their axes approximately perpendicular to the stress.

L. J. S.

RR (W. A.) [1881–1939] & KELLER (W. D.). *Chert in the Grenville marble, Ross township, Renfrew County, Ontario.* Journ. Geol. Chicago, 1940, vol. 48, pp. 196–204, 3 figs.

Nodules of primary chert occurring in the Grenville dolomitic limestone of -Cambrian age are in part metamorphosed to diopside, tremolite, talc, and pentine. C. F. D.

Stuart (Alan) & Simpson (Brian). *The shore sands of Cornwall and Devon fr Land's End to the Taw-Torridge estuary.* Trans. Roy. Geol. Soc. Cornwa 1937, vol. 17, pt. 1, pp. 13–40, 3 figs., 2 folding tables.

The quantitative distribution of over 60 minerals in the sands from 18 locali has been measured. The sands appear to be mainly of local origin, longsh drift being only very small; little if any Pliocene material is present, but i probable that glacial material has contributed considerably in the north. Per idiomorphic baryte in the Taw-Torridge estuary is believed to be a chem precipitate. M. H. H.

Smithson (Frank). *The Middle Jurassic rocks of Yorkshire: a petrological palaeogeographical study.* Quart. Journ. Geol. Soc. London, 1942, vol. pp. 27–59, 15 figs.

A petrographical examination of the sandy sediments between the Dogger a the Cornbrash indicates that the assemblage of detrital minerals in the m southerly and westerly outcrops is relatively rich; over the Cleveland axis, h ever, the assemblage is poor in detrital species, because of post-depositio secondary changes, though rich in authigenic brookite and anatase. Many gra of anatase, apatite, brookite, chloritoid, garnet, kyanite, staurolite, and to maline are figured to show etching, secondary outgrowths, &c. The variati in frequency and size of the mineral constituents are studied by statistical a cartographic methods, and the bearing of the assemblages on questions of pala geography is discussed. [M.A. 8–237.] C. F. D.

Dietz (R. S.), Emery (K. O.), & Shepard (F. P.). *Phosphorite deposits on sea floor off southern California.* Bull. Geol. Soc. Amer., 1942, vol. pp. 815–847, 3 pls., 1 text-fig.

Phosphatic nodules dredged in large quantity from the sea floor off southe California are formed of concretionary layers of collophane with inclusions (?) francolite replacing calcareous organic remains. Six chemical analyses of t concretions all show an excess of fluorine over the requirements of the flu apatite formula. The nodules were formed in situ, by direct precipitation fr ocean water. C. F. D.

Economic Minerals and Ore-deposits.

Bostock (H. S.). *Mining industry of Yukon, 1939 and 1940.* Mem. Geol. Su Canada, 1941, no. 234, li+40 pp. Price 25 cents.

Information on mining and production with special reference to gold. Occ rences of cassiterite, cinnabar, scheelite, ferberite, and stibnite suggest th commercial deposits might be found. A great tonnage of manganiferous chalyb (one assay gave Mn 12·65 %) forms the main gangue of the silver-lead veins Keno Hill near Keno City. M. A. P.

Kindle (E. D.). *Mineral resources, Hazelton and Smithers areas, Cassiar a Coast districts, British Columbia.* Mem. Geol. Surv. Canada, 1940, no. 22 ii+107 pp., 4+7 pls., 4 text-figs. Price 25 cents.

These areas on the east flank of the Coast Ranges (8000 feet) include deposi

ntaining gold, silver, lead, zinc, copper, antimony, bismuth, cobalt, tungsten, lybdenum, and some poor coal. The report gives geological notes, mineral nes, and details of development, output, and assays relating to 57 groups of ims visited in 1937–8. Among the less common ore-minerals 'jamesonite' is quently mentioned [M.A. **8**–7], and gold is associated with 'tetradymite' at acier Gulch [M.A. **8**–108, 286.]. M. A. P.

RD (C. S.). *Mineral industry of the Northwest Territories.* Mem. Geol. Surv. Canada, 1941, no. 230, vi+136 pp., 9 figs. (maps). Price 50 cents.

Since the discovery of rich native silver and pitchblende on the east shore of eat Bear Lake, by Gilbert LaBine in 1930, the value of mineral production his vast territory (60–68° N., 109–126° W.) has risen from practically nothing about $2,000,000 in gold, silver, copper, natural gas, and petroleum, and about ,400,000 in radium-uranium concentrates, in 1939. The report is a compilation nformation, with observations made in 1939, on the location, history, geology, elopment, and mining and milling operations of 75 groups of claims. Slow sonal transportation by land and water routes is supplemented by aeroplane vices (seaplane in summer, skiplane in winter) carrying passengers and freight m Edmonton, Alberta, to most settlements. [M.A. **8**–246.] M. A. P.

OMSON (Ellis). *The mineralogy of the Kerr-Addison ore, Larder Lake, Ontario.* Univ. Toronto Studies, Geol. Ser., 1941, no. 46, pp. 141–147.

Twenty-two specimens from six levels (175–1300 feet) show the following tallic minerals in order of decreasing abundance: pyrite, mispickel, chalcorite, magnetite with ilmenite, and rare blende, galena, pyrrhotine, and gold. ne variations with depth are noted. A green mica in the gangue gives only race of Cr in 12 gm. (L. J. Rogers). M. A. P.

HNSTON (W. D., *Jr.*). *The gold quartz veins of Grass Valley, California.* Prof. Paper U.S. Geol. Surv., 1940, no. 194, 101 pp., 39 pls., 69 text-figs. Price $2.50.

These gold quartz veins were discovered in 1850 and have since yielded over 50 million in gold. Mining is now carried out to a vertical depth of 3700 feet. e present lengthy memoir gives a detailed account of the origin and mineralogy the quartz veins (which are wholly of magmatic derivation), the paragenesis the vein-forming minerals, methods of vein formation, geothermal gradients, d the geology and history of the mines. C. F. D.

AKYAN (P. S.) Саакян (П. С.). К металлогении центрального Кавказа.— *To the metallogeny of central Caucasus.* Труды Всесоюзн. Научно-Иссл. Инст. Мин. Сырья (Trans. All-Union Sci. Research Inst. Econ. Min.), 1939, no. 147, pp. 19–33, 1 pl. (Russian with English summary.)

Four types of acid intrusions, each with a distinct metallogeny, are found in central Caucasus: (1) pre-Cambrian porphyritic granites with rare metals and d; (2) pre-Cambrian non-porphyritic granites, with tin-bearing pegmatites; Variscan granites with gold-bearing quartz; (4) Alpine granodiorites, with

metallic sulphides. The difference in types of mineralization is explained b initial geochemical peculiarities and by different depths of erosion. C. F. D.

Petrovskaya (N. V.) Петровская (Н. В.). *Morphology and structure of "new gold.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 32, pp. 427–42 1 fig.

It has been shown that gold is not infrequently deposited from solutions o the particles already present in a placer; this secondary deposit may form sma crystals growing on and sometimes covering the original fragments, or may h of a spongy texture. M. H. H.

Barsanov (G. P.) Барсанов (Г. П.). *On the mineralogy of the Urutukan depos (Upper Kolyma, Far East Region).* Compt. Rend. (Doklady) Acad. Sc URSS, 1941, vol. 31, pp. 689–690.

The paragenesis of the gold ores—a brecciated quartz-mispickel-pyrite vein- is discussed. M. H. H.

Baud (Louis). *Sur la présence d'or libre dans les roches basiques du cercle de Kay (Haute Côte-d'Ivoire).* Compt. Rend. Acad. Sci. Paris, 1942, vol. 214, pp. 38 381.

Gold was found as grains up to $\frac{1}{2}$ mm., often with pyrite, in most of the bas rocks (gabbros, ophites, basalts, and hornblende-schists), usually less than 1 per ton, but in one specimen 32·75 g. per ton. The neighbouring granites conta little or no gold (three specimens with 1–2 g. per ton), and the mica-schists non L. J. S.

Junner (N. R.), Hirst (T.), & Service (H.). *The Tarkwa goldfield.* Mem. Go Coast Geol. Surv., 1942, no. 6, 75 pp., 26 pls. (incl. 1:25,000 geol. ma Price 8*s*.

This memoir comprises 21 pages on physical features and general geolog followed by detailed descriptions of the mines. The gold-bearing conglomerat of the Banket series (Tarkwaian system) exhibit cross-bedding, ripple-markin and other depositional features suggesting that they were formed under mixe continental and littoral environments. A placer origin is advocated for t banket gold, which in grain-size is comparable to gold from Gold Coast riv gravels. C. F. D.

Bichelonne (J.) & Angot (P.). *Le bassin ferrifère de Lorraine.* Nancy-Stra bourg (Imprimerie Berger-Levrault; Comité des Forges et Mines de Fer l'Est de France et Assoc. Minière d'Alsace et de Lorraine; Comm. d'Étud Géol. du Bassin Lorrain), 1939, pp. xi+483, 24 pls., 73 text-figs.

Bichelonne (—) & Angot (—). *La formation ferrifère Lorraine; Atlas.* [193 4 pp.+26 maps (1:50,000) in folder. 18×27 inches.

This lengthy and lavishly produced royal quarto volume treats of the stra graphy, petrography, palaeontology, and tectonics of the iron-ore fields

raine. The work is in two parts, the first or general section containing a rographic classification of the oolitic ores and a discussion on their genesis, ile the second section gives detailed descriptions of the deposits on a regional is. In an appendix of 31 pages L. Cayeux contributes a brief petrographic ount of specimens from selected workings, but no optical or chemical data the ore minerals are included. Photomicrographs of the ores, 42 in number, beautifully reproduced in colour, each reproduction being 16 × 10·5 cm.; tual reference to the mineral grains illustrated in these photomicrographs is ctively made by a system of rectangular co-ordinates. C. F. D.

GNUSSON (Nils H.). *Herrängsfältet och dess järnmalmer—The Herräng field and its iron ores.* Årsbok Sveriges Geol. Undersökning, 1940, vol. 34, no. 1, pp. 1–72 (Swedish), pp. 73–78 (English summary), 8 pls. (= figs. 35–50) + map, 34 text-figs. Price 3.00 kr.

The Herräng field, 95 km. NNE. of Stockholm, consists principally of two mplexes of grey and red granites respectively which, by magmatic stoping, ve invaded a series of soda-leptites and limestones. Analytical evidence of similation of leptite by granite is given. Skarn ores, principally magnetite, th late pyrite, pyrrhotine, chalcopyrite, blende, galena, and rare scheelite and olybdenite, are produced where both the older and younger granites penetrate nestone, the older skarns being characterized by andradite, diopside-hedenrgite, actinolite, and locally anthophyllite and cummingtonite, while the unger skarns yield a more aluminous garnet but a more iron-rich pyroxene. rther skarns are produced by late hypabyssal greenstones. Analyses, by G. ssarsson, include: I, hornblende from Glitter mine; II, diopside-hedenbergite om Fabian mine; and III, garnet from Eknäs mine.

	SiO_2.	TiO_2.	Al_2O_3.	Fe_2O_3.	FeO.	MnO.	MgO.	CaO.	Na_2O.	K_2O.
I.	39·62	0·36	10·83	7·34	17·74	0·99	5·76	11·70	1·36	1·66
II.	51·00	0·00	0·00	2·38	14·22	0·30	8·80	22·42	0·26	0·00
III.	35·70	0·24	6·34	21·68	3·26	1·50	0·34	29·80	0·00	0·00

	H_2O.	CO_2.	F.	Cl.	Total.	Sp. gr.	α.	γ.	2V.	$\gamma : c$.
I.	2·17	0·00	0·63	0·16	100·32	3·345	1·694	1·716	55°	18°
II.	0·38	0·16	0·16	0·02	100·10	3·46	1·700	1·725	60°	43°
III.	0·46	0·58	0·00	0·00	99·90	3·71	—	—	—	—

C. F. D.

ATHIAS (Morna). *The occurrence of barite in an iron ore deposit in Namaqualand.* Trans. Roy. Soc. South Africa, 1940, vol. 28, pp. 207–217, 3 figs.

On the farm Zuurwater in NE. Namaqualand a deposit of magnetite and ematite (46,000 tons exposed) carries baryte (α 1·637, β 1·638, γ 1·647, 2V 40°) principal gangue mineral. The deposit is believed to be due to metasomatic placement of quartzite. No mention of a similar association could be found available literature. [Cf. the metasomatic haematite-baryte deposits exploited Khenifra in French Morocco.] C. F. D.

Faessler (Carl) & Schwartz (G. M.). *Titaniferous magnetite deposits of Sept-Iles Quebec.* Econ. Geol., 1941, vol. 36, pp. 712–728, 13 figs.

These deposits are irregular masses, lenses, or bands occurring in the outer zones of an anorthosite-gabbro complex on the north shore of the St. Lawrence river about 300 miles NE. of the city of Quebec. Polished sections of the ore show titanomagnetite with inclusions of ilmenite and some transparent spinel (?). The ilmenite occasionally forms the usual lamellae along the (111) planes of the magnetite; more often it appears as blades *en échelon* or as curved or irregular stringers indicating deformation of the ore after it crystallized but before the ilmenite separated by ex-solution. M. A. P.

Frankel (J. J.) & Grainger (G. W.). *Notes on Bushveld titaniferous iron ore.* South African Journ. Sci. (S. Afr. Assoc. Adv. Sci.), 1941, vol. 37 (for 1940), pp. 101–110, 11 figs.

In a microscopic study of polished sections of the titaniferous iron ores of the Bushveld complex the minerals noted were maghemite (magnetic titaniferous Fe_2O_3), coulsonite ('vanado-magnetite') [M.A. **6**–489], magnetite, ilmenite, haematite, limonite (earthy goethite), sparse silicates and chalcopyrite. The proportion of V_2O_3 in the coulsonite rarely exceeds 1%, and in the maghemite ranges from 0·14 to 0·99 %. As the properties of these two minerals are similar, it is suggested that coulsonite does not differ from maghemite rich in vanadium. C. F. D.

Bloomer (R. O.) & De Witt (Wallace, *Jr.*). *Titaniferous sandstone near Buena Vista, Virginia.* Econ. Geol., 1941, vol. 36, pp. 745–747, 2 figs.

This lenticular fossil placer in Rockbridge Co. contains up to 50 % of rutile and ilmenite and suggests that tin-bearing sandstones may be found along the west flanks of the Blue Ridge. M. A. P.

Schmassmann (Hansjörg) & Bayramgil (Orhan). *Diluviale Manganerze im Rheintal bei Muttenz (Basel-Landschaft). Ein Beitrag zur Kenntnis terrestrischer Eisen-Mangan-Lagerstätten.* Tätigkeitsber. Naturfor. Gesell. Baselland, 1942, vol. 12 (for 1939–41), reprint pp. 1–23, 5 figs.

Small deposits of wad mixed with quartz, limonite, and calcite (MnO_2 44·84, Fe_2O_3 6·25 %, &c.) occur in cavities and crevices. A review is given of the literature on the deposition of these from bicarbonate solutions resulting from weathering, and it is believed that the action is largely bacterial. L. J. S.

Wilson (Eldred D.). *Tungsten deposits of Arizona.* Bull. Arizona Bureau of Mines, 1941, no. 148 (Geol. Ser. no. 14) = Bull. Univ. Arizona, vol. 12, no. 2, 54 pp., 1 fig. (map). Price 25 cents.

The tungsten minerals of Arizona include principally ferberite, wolframite, hübnerite, scheelite, powellite, cuprotungstite, and tungstite, only the first four being of commercial importance. Thorotungstite and tungsten-bearing hollandite occur rarely. A description is given of thirty tungsten-bearing districts within the state. C. F. D.

(E. F.) Зив (Е. Ф.). Шеелитоносность скарнов восточного склона Кузнецкого Ала-тау. *Scheelite in skarns of the eastern slope of the Kuznetsk Ala-tau.* Труды Всесоюзн. Научно-Иссл. Инст. Мин. Сырья (Trans. All-Union Sci. Research Inst. Econ. Min.), 1939, no. 145, 166 pp., 35 figs. (Russian with English summary, pp. 159–161.) Price 5r. 85k.

Deposits of scheelite occurring in skarns at this locality in the Krasnoyarsk trict of the Khakass Autonomous Region are undergoing economic develop- nt. Accompanying the scheelite are andradite, diopsidic pyroxene, scapolite alyses of these are given), and many other skarn minerals. The paragenesis he occurrences is discussed. C. F. D.

NAM (T. R.), CHESTERS (J. H.), HOWIE (T. W.), & JAY (A. H.). *Shetland chromite as a refractory mineral.* Trans. British Ceramic Soc., 1942, vol. 41, pp. 27–45, 8 figs.

description is given of the technology of the chromite which occurs, asso- ed with serpentine, around Baltasound and Haroldswick, island of Unst, and ich has been worked for some years for use in refractory bricks. [M.A. **8**–169.] C. F. D.

LYANOV (D. G.), GRITZAENKO (G. S.), KRUTOV (G. A.), PETROVA (E. A.), & SHISHULINA (M. G.)] Ульянов (Д. Г.), Грицаенко (Г. С.), Крутов (Г. А.), Петрова (Е. А.) и Шишулина (М. Г.). Месторождения силикатно-никелевых руд Орско-Халиловского района.—ULYANOV (D. G.), GRITSAENKO (G. S.), KRUTOV (G. A.), PETROVA (E. A.), and SHISHULINA (M. G.). *The nickel-silicate ore deposits of the Orsk-Khalilovo region.* Труды Всесоюзн. Научно-Иссл. Инст. Мин. Сырья (Trans. All-Union Sci. Research Inst. Econ. Min.), 1937, no. 118, 127 pp., 3 pls., 15 text-figs. Price 5r. 75k. (Russian with English summary.)

The nickel ores of the Orsk (Akkermanovka) and Khalilovo districts on the stern slopes of the southern Urals form veins, with associated hydrothermal artz and chalcedony, in bodies of serpentinized harzburgite. Locally the de- sits show extensive carbonatization and nontronitization, with enrichment of ckel in the zones of weathering. The memoir includes detailed optical and emical studies of garnierite and revdinskite, and of various specimens of idellite, cerolite, zermattite, and parasepiolite, all more or less nickeliferous. -ray data are given for garnierite and revdinskite. Chemical analyses of asbo- ne, wad, and psilomelane show variable, often high, contents of nickel and balt. C. F. D.

ANDEFUR (Bennett T.). *The geology and paragenesis of the nickel ores of the Cuniptau mine, Goward, Nipissing district, Ontario.* Econ. Geol., 1942, vol. 37, pp. 173–187, 12 figs.

This mine, named after the important metals recovered (Cu, Ni, Pt, Au), lies a region of thick Keewatin lavas that were folded, faulted, and intruded by eridotite which in turn was fractured, altered, and mineralized, and later jected by Keweenawan dikes. The important ores are chalcopyrite, pyrrhotine,

pentlandite, pyrite, marcasite, magnetite, chromite, blende. The main source of nickel is violarite which is an alteration product of massive pentlandite.

M. A. P.

Sinkler (Helen). *Geology and ore deposits of the Dillon nickel prospect, southwestern Montana.* Econ. Geol., 1942, vol. 37, pp. 136–152, 2 figs.

Nickel occurs as annabergite in saxonite (harzburgite) associated with enstatolite (enstatite-rock), peridotite, nickeliferous serpentine, hornblendite, &c., 2 miles SE. of Dillon, in Beaverhead and Madison Counties. A partial analysis of the annabergite, by H. J. Harrity, gave As_2O_5 44·11, NiO 28·71, MgO 2·19, H_2O [moisture?] 0·60. On 21·6 mg. M. Fleischer got NiO 34 %. In the absence of nickel arsenides the arsenate may have formed by hydrothermal action on nickel-bearing olivine and enstatite.

M. A. P.

Wolf (Herbert). *Die Gesteine und Erzgänge der Umgebung von Wittichen im mittleren Schwarzwald.* Neues Jahrb. Min., Abt. A, 1942, vol. 77, pp. 175–237, 3+2 pls., 24 text-figs.

After being abandoned for 70 years the mines at Wittichen in Baden were reopened in 1936. The ore-veins are all in granite, Co-Ni-Bi-Ag veins with a NNW.–SSE. direction and Cu-Bi veins W.–E. Varieties of the granite are distinguished according to grain-size—medium, coarse, and very coarse. The last of these is due to a later growth of orthoclase which encloses corroded remnants of quartz. There is also a tourmaline-bearing granite-pegmatite. The rocks have suffered hydrothermal alteration along crevices. Quartz and fluorite were deposited followed by native silver and native bismuth. Then came the main ore deposition with niccolite, rammelsbergite, safflorite, and smaltite, and the gangue minerals baryte, fluorite, and calcite. Later earth movements gave other fissures in which copper minerals, emplectite, chalcopyrite, and chalcosine, were deposited.

L. J. S.

Gysin (Marcel). *Sur la présence de cobalt dans le minerai de fer de Divrik (Turquie).* Compt. Rend. Soc. Physique Hist. Nat. Genève, 1942, vol. 59, pp. 142–147.

Magnetite occurs as a lenticular mass between monzonite and metamorphic rocks with dolomite and mica-schist. In it a small amount of cobalt and traces of nickel were found. These are present in isotropic yellowish-grey grains embedded in veinlets in the magnetite.

L. J. S.

Novokhatsky (I. P.) & Kalinin (S. K.) Новохатский (И. П.) и Калинин (С. К.). *Cobalt in mine waters.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 31, pp. 591–593.

Slightly acid water from copper mines in Kazakhstan contains 0·02–0·2 mg. Co per litre, often together with Mn and Cu. This accounts for the deposition of various forms of wad from surface waters.

L. J. S.

RELS (R. M.,. *The Mississippi valley type of lead-zinc deposits and the problem of mineral zoning.* Econ. Geol., 1941, vol. 36, pp. 729–744, 1 fig.

he order of formation of blende and galena may be due to deposition from entrated chloride solutions, not from dilute alkaline solutions. [M.A. 8–111.]

M. A. P.

TIN (Edson S.), editor. *Contributions to a knowledge of the lead and zinc deposits of the Mississippi valley region.* Special Papers Geol. Soc. Amer., 1939, no. 24, xii+156 pp., 4 pls., 27 text-figs.

ifteen authors collaborate in this symposium on a region which includes the t important lead and zinc deposits of the United States. The principal pters include discussions on the stratigraphy of the sedimentary country-s, the relation between structure and mineralization, the igneous rocks of area, and the paragenesis and origin of the ore-bodies. C. F. D.

TALL (R. H.). *The ore deposits of the Skiddaw district.* Proc. Yorkshire Geol. Soc., 1942, vol. 24 (for 1941), pp. 328–343, 3 figs.

he rocks of the copper-zinc-lead veins of the northern part of the Lake rict are described petrographically; the mineralization is of Caledonian age, probably connected with the intrusion of the Skiddaw granite. Chlorite in uartz-chlorite-rock from Dale Head exhibits spherulitic, vermicular, and eau structure and stains readily with methylene blue, assuming a marked ochroism, β and γ clear blue, α violet ($\beta = \gamma > \alpha$). C. F. D.

Ching-Yuan). *Genesis of some ore deposits of southeastern Maine.* Bull. Geol. Soc. Amer., 1942, vol. 53, pp. 15–51, 5 pls., 1 text-fig.

re-deposits of copper, zinc, lead, and a little silver occurring in highly meta-phic schist within $\frac{1}{4}$–2 miles of a large granite intrusion exhibit a rude zonal angement, copper ores being found close to, and zinc and lead deposits farther m, the granite. The paragenetic sequence is magnetite, mispickel, pyrite, rrhotine, blende, chalcopyrite, and galena; this sequence holds true for nerous mines scattered throughout a belt more than 100 miles long.

C. F. D.

RRESTER (J. D.). *A native copper deposit near Jefferson City, Montana.* Econ. Geol., 1942, vol. 37, pp. 126–135, 2 figs.

Native copper occurs as flour, scale, and nuggets, and as a cement in peat, ociated with bog-iron-ore and gravel in Copper Gulch, Jefferson Co. The al was derived from veins, carried as copper sulphate by sub-surface waters taining up to 4 mg. Cu in 100 c.c., and precipitated by the bog-ore.

M. A. P.

UKOV (A. A.) & AIDINYAN (M. Kh.) Сауков (А. А.) и Айдиньян (М. Х.). *The clarke of mercury in the earth's crust.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 32, pp. 358–360.

Mercury has been determined in 24 samples of acid intrusives (representing

100 specimens) and 18 samples of basic effusive rocks (46 specimens); the averag amounts present were $6{\cdot}4 \times 10^{-6}$ and 9×10^{-6} % respectively; hence the probab mercury content of the earth's crust is $7{\cdot}7 \times 10^{-6}$ %. [M.A. 6–286.]

M. H. H.

Stevenson (John S.). *Mercury deposits of British Columbia.* Bull. Britis Columbia Dept. Mines, 1940, no. 5, v+93 pp., 7 pls., 6 text-figs. (mimeo graphed).

Small quantities of cinnabar occur in fracture zones in metamorphic rocks Pinchi Lake and several other localities. The production of mercury in 1938 w 10 flasks (= 0·3 metric ton). L. J. S.

Rigal (Remigio). *Las minas de columbita y tantalita y el descubrimiento minerales de uranio radioactivos en la Cañada de Alvarez, Dep. Calamuchi Córdoba.* Boletín Dirección de Minas y Geología, Argentina, 1938, no. 4 31 pp., 4 maps, 5 pls.

Pegmatites with columbite, tantalite, gahnite, garnet, a radioactive 'baue tized' mica, triplite, gummite, autunite, and torbernite are mined for the fi two of these minerals. Full or partial chemical analyses of all the abov mentioned minerals are given. C. F. D.

Бокситы. *Bauxites.* Vol. 1, part 1. Труды Всесоюзн. Научно-Иссл. Инс Мин. Сырья (Trans. All-Union Sci. Research Inst. Econ. Min.), 193 no. 110, 171 pp., 2 pls., 40 text-figs. Price 6r. 50k.; vol. 1, part 2, ibi 1936, no. 111, 232 pp., 3 pls., 68 text-figs. Price 10r.; vol. 2, ibid., 193 no. 112, 116 pp., 2 pls., 25 text-figs. Price 5r.; vol. 3, ibid., 1938, no. 12 76 pp., 6 pls., 7 text-figs. Price 4r. 50k.; vol. 4, ibid., 1939, no. 151, 103 p 1 pl., 43 text-figs. Price 5r. 50k. (Russian with English summaries.)

The above volumes comprise eighteen papers by various authors (B. M. Fed rov, P. L. Besrukov [Bezrukov], A. L. Yanshin, N. G. Markova, N. A. Shtre A. K. Belousov, N. V. Soloviev, E. N. Tschukina [Shchukina], E. V. Rozhkov M. V. Soboleva, A. N. Lyamina, and E. M. Velikovskaya) on the distributio geology, mineralogy, chemistry, and genesis of bauxite deposits of the U.S.S.I A. D. Arkhangelsky contributes an introduction with a useful map, and edi vols. 1 and 2. Most of the occurrences, whether of Palaeozoic (mainly Upp Silurian—Lower Devonian) or Mesozoic (Jurassic) age, are of pisolitic charact and are believed to be of lacustrine (sometimes marine) deposition, homologu of bedded iron ores into which they may locally merge. In the eastern Ura the Palaeozoic ores, typified by the important 'Krasnaya Shapochka' deposi are conformably interbedded with marine limestones. Replacement of limeston by bauxite at Nizhne-Serginsky gives rise to the sequence: bauxite—calcareou bauxite—bauxitic limestone. The common ore of commercial importance is pis litic diaspore, with or without varying proportions of chamosite and hydr haematite. Carboniferous (Middle—Upper Tournaisian) bauxites of lagoona marine facies found in the south part of the Moscow basin are, however, forme of allophane, gibbsite, and kaolinite, with minor jarosite, gypsum, and alunit Accounts are given of experimental work by Rozhkova and Soloviev on th

itions of formation of pisolitic iron-aluminium ores, and by Soloviev on action of carbonated waters on aluminosilicate rocks. An X-ray study of alline daphnite occurring in veinlets and cavities in bauxite at Idvel, north s, is contributed by Lyamina; chemical and optical investigation of this ral, by Soboleva, gives SiO_2 19·60, TiO_2 0·58, Al_2O_3 27·26, Fe_2O_3 1·99, FeO , MgO 1·36, CaO 1·06, MnO 0·05, H_2O+ 10·46, H_2O- 0·20 = 100·85; 58, γ 1·672, sp. gr. 3·209–3·216. C. F. D.

ENEN (J. R.) & BURCHARD (Ernest F.). *Bauxite resources of the United States.* Report of Investigations, U.S. Bur. Mines, 1941, no. R.I. 3598, 42 pp., 1 fig. (mimeographed).

summary account of the resources of bauxite in the U.S.A., with statistics erves of ore. C. F. D.

LSKY (B. P.) & BUCHNEVA (S. K.) Уральский (Б. П.) и Бучнева (С. К.). Кислотоупорный асбест на Урале. *Acid-resistant asbestos in the Urals.* Труды Всесоюзн. Научно-Иссл. Инст. Мин. Сырья (Trans. All-Union Sci. Research Inst. Econ. Min.), 1939, no. 146, pp. 79–89. (Russian with English summary.)

brief description of Uralian occurrences of amphibole-asbestos. The range mposition of anthophyllite fibre from the important deposit at Sysertsky is n. Anthophyllite from (I) Kochnevsky in the southern Urals and (II, III) rnorsky in the middle Urals gives:

	SiO_2.	Al_2O_3.	Fe_2O_3.	FeO.	MnO.	MgO.	CaO.	$(Na,K)_2O$.
	57·46	0·79	0·81	13·21	0·50	24·44	0·32	0·14
I.	60·39	0·32	0·30	5·47	0·05	29·44	nil	0·35
II.	59·83	0·46	0·71	6·20	0·04	28·65	nil	0·31

	H_2O+.	H_2O-.	CO_2.	TiO_2.	Cr_2O_3.	Volatiles.	Total
	2·58	0·06	0·10	trace	trace	0·21	100·62
I.	2·85	0·18	nil	trace	—	0·79	'100·29'
II.	2·60	0·25	nil	trace	—	0·94	'100'

C. F. D.

ZYL (J. S.), BOARDMAN (L. G.), BRANDT (J. W.), & DE VILLIERS (J.). *Magnesite in the Union of South Africa.* Mem. Geol. Surv. South Africa, 1942, no. 38, 74 pp., 15 pls., 6 text-figs. Price 5*s*.

agnesite occurs in quantity only in the Kaapmuiden area, Barberton district; Burgersfort area; and the Sutherland range, 50 miles north of the Murchison ge. Exploitable reserves do not exceed 260,000 tons. All deposits are asso-ed with serpentine and other ultrabasic rocks. C. F. D.

BY (Shirley F.). *Occurrences and uses of dolomite in the United States.* Information Circular, U.S. Bur. Mines, 1941, no. I.C. 7192, 21 pp., 1 fig. (mimeographed.)

CHITZKY (V. I.)] Лучицкий (В. И.), editor. Плавиковый шпат в СССР.— LUCHITSKY (V. I.). *Fluorspar in USSR.* Труды Всесоюзн. Научно-Иссл. Инст. Мин. Сырья. (Trans. All-Union Sci. Research Inst. Econ. Min.), 1937, no. 119, 336 pp., figs. (Russian with English summary.)

he fluorite deposits described in this series of 21 articles by several authors

occur at various localities in southern Kazakhstan and Middle Asia, the F East, western Siberia, Tadzhikistan, and eastern Transbaikalia. Optical fluor is worked at lake Kuli-Kolon in Tadzhikistan. C. F. D.

[Sverchkov (V. S.)] Сверчков (В. С.). Амдерминское месторождение плав кового шпата.—Swerchkov (W. S.). *The Amderma deposit of the fluor* Труды Аркт. Научно-Иссл. Инст. (Trans. Arctic Inst.), Leningrad, 19 vol. 134, 83 pp., 25 figs.

High-grade fluorite ore was discovered in 1932 in the region of Amderma riv on the NW. side of Yugorsky peninsula, NE. Russia. The ore occurs in the fo of flats and veins in the lower Palaeozoic limestone. The ore is composed fluorite, quartz, calcite, blende, chalcopyrite, and pyrite. A variety of metas matized limestone, composed of quartz, sericite, calcite, dolomite, and pyrite b been named 'amdermite' by P. V. Wittenburg. The ore is probably of metas matic origin. S. I. T.

Osborne (F. Fitz). *Anhydrite and gypsum at Calumet mines, Calumet Isla Quebec.* Univ. Toronto Studies, Geol. Ser., 1941, no. 46, pp. 75–82.

Cores from drill-holes in Grenville limestone contain colourless to browni coarsely crystalline anhydrite altering to gypsum. The anhydrite has replac calcite and it is suggested that the sulphate is of magmatic origin.

M. A. P.

Florensky (V. P.) Флоренский (В. П.). *Celestite in Permian deposits of t Bashkir Autonomous Socialist Soviet Republic.* Compt. Rend. (Doklad Acad. Sci. URSS, 1941, vol. 31, pp. 784–786.

Celestine is widespread in Permian deposits in eastern European Russia, a is now recorded as small concretions in marls, dolomites, and anhydrites, fro bore holes in the Tuimasa area near Ufa. It appears to be a normal compone of the Permian dolomite-anhydrite deposits, and to be formed in the norm course of salt deposition and not as a biochemical deposit. M. H. H.

Muddiman (E. W.). *Witherite.* Journ. Oil & Colour Chemists' Assoc., 194 vol. 25, pp. 127–142, 4 pls., 4 text-figs.

Details are given of the occurrence, mining, and preparation of witherite the Settlingstones mine near Fourstones in Northumberland, and at the Morris north pit of the Holmside and South Moor Collieries Ltd., Annfield Plain, in t north of Co. Durham. [M.A. 8–43.] L. J. S.

Cummings (J. M.). *Saline and hydromagnesite deposits of British Columbia.* Bu British Columbia Dept. Mines, 1940, no. 4, v+160 pp., 3 pls., 13 text-fig (mimeographed).

Considerable quantities of sodium carbonate, sodium sulphate, and magnesiu sulphate are collected from several small lakes [M.A. 3–542]. Hydromagnesi forms deposits in valley bottoms in the Cariboo, Atlin, and Kamloops district Most of the analyses show too little water for hydromagnesite, but some approx mate to $3MgCO_3.Mg(OH)_2.3H_2O$. The material contains minute (1–10 μ) crysta

agnesite (ϵ 1·510, ω 1·700), and plates (n 1·525) and fibres (n 1·540 along length, n 1·520 across the fibres) of hydromagnesite (?), together with some te and fragments of various rock-forming minerals. L. J. S.

OLAEV (V. I.) & KACHALOV (A. I.) Николаев (В. И.) и Качалов (А. И.). *Separate production of Glauber's salts and epsomite from natural astrakhanite.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 31, p. 572.

strakanite [= blödite, $MgSO_4.Na_2SO_4.4H_2O$] is of abundant occurrence in Astrakhan lakes. A solution saturated at 25° C. when cooled to 0° deposits ber's salt [= mirabilite, $Na_2SO_4.10H_2O$]. The solution is then mixed with ural brine rich in $MgCl_2$ or with $MgSO_4$ in suitable proportions and on cooling ° epsomite ($MgSO_4.7H_2O$) is deposited. The remaining solution still con- ing $MgCl_2$ is evaporated and used in the cycle. L. J. S.

NTZOVA (S. V.) Одинцова (С. В.). *Nitre formation in deserts.* Compt. Rend. (Doklady) Acad. Sci. URSS, 1941, vol. 32, pp. 578–580.

Nitrates occur widely in the western Pamirs; the region is very dry, with reme daily temperature range. Bacteria of the *Azotobacter* type are absent, blue-green algae were found, identified as *Gloeocapsa minor*, and shown to capable of fixing nitrogen as nitrate when grown in presence of $CaCO_3$.

M. H. H.

Miscellaneous.

ESSLER (A.). *Untersuchungen zum Problem des metamikten Zustandes.* Zeits. Krist., 1942, vol. 104, pp. 81–113, 2 figs.

The term metamict for the glassy-amorphous state of some otherwise crystal- e rare-earth and metal-acid minerals is due to W. C. Brögger [article 'Amorph' Salmonsen's Conversations-Lexicon, Copenhagen, 1893; incorrect references e given in the paper]. Metamict minerals are: orthite, gadolinite, thalenite, gusonite, sipylite, risörite, yttrotantalite, samarskite, euxenite, polycrase, mstrandine, polymignite, pyrochlore, tritomite, cappelenite, melanocerite, ryocerite, eucolite, eudialyte, thorite, zircon, malacon, and alvite. Other allied nerals not recorded in the metamict state are: thortveitite, columbite, stibio- ntalite, xenotime, monazite, thorianite, bröggerite, yttrofluorite, and bastnä- e. Metamict gadolinite is optically isotropic and gives no X-ray pattern, but ter ignition it is birefringent and gives a good X-ray pattern. The change takes ace suddenly at about 800° with a brilliant glow; and also takes place slowly lower temperatures (590°). Determinations of the specific heat of gadolinite different temperatures show that this is greater for material in the metamict an in the crystalline state, and the sudden glowing is due to this. The reduction the metamict state is probably due to α radiation from radioactive substances; nd it is suggested that minerals with extensive isomorphous replacements are ss stable and liable to the change over [but not in the case of zircon].

L. J. S.

Mason (Brian) & Berggren (Thelma). *A phosphate-bearing spessartite gar from Wodgina, Western Australia.* Geol. För. Förh. Stockholm, 1942, vol. (for 1941), pp. 413–418.

A pale pink, isotropic spessartine occurs in veins cutting a specimen of lith philite and sicklerite from one of the tantalum-ore pegmatites of the Wodgi district. Three analyses (by Berggren), with P_2O_5 4·10, 2·96, 0·74, indicate th part of the SiO_4 groups are replaced by PO_4. Other examples of replacement silicon by phosphorus are listed. The analysis highest in phosphate is P_2O_5 4·1 SiO_2 33·36, TiO_2 0·00, Al_2O_3 14·99, Fe_2O_3 0·83, FeO 1·71, MnO 43·10, MgO 0·(CaO 1·10, Li_2O 0·10, Na_2O 0·21, K_2O 0·00, H_2O+ 0·48, H_2O- 0·10, CO_2 0·(F 0·00 = 100·08, sp. gr. 4·16. X-ray powder photographs of the material co taining P_2O_5 4·10 % gave a unit cell of edge a 11·58 Å., calculated density 4·3

C. F. D.

Hayes (Junius J.) & Crawford (Arthur L.). *Calcite crystals of rare habit a beauty.* Proc. Utah Acad. Sci. Arts & Letters, 1941, vol. 18, p. 18.

A small vug from the U.S. mine, Bingham, Utah, is lined with dog-too crystals of calcite, and the clay filling contains clear cuboidal crystals (3–6 m edge) of calcite, probably $(05\bar{5}4)$ or $(03\bar{3}2)$, from the apex of which projects a lo (16 mm.) spike formed by a steep negative scalenohedron, probably $(24\bar{6}1)$.

L. J. S.

McConnell (Duncan). *Barrandita, mineral constitutivo de los depósitos de fosfa de la isla Gran Roque, D.F., Venezuela.* Revista del Colégio de Ingenieros d Venezuela, Cacares, 1941, vol. 19, no. 140, p. 115–119, 1 fig. (Reprint 16 pp

In a paper on the geology of the island Gran Roque, S. E. Aguerrevere an V. M. López (Bol. Geol. y Min. Cacares, 1938, vol. 2, pp. 151–180) give an analys of an Al-Fe phosphate. This is now identified as barrandite [M.A. **8**–51]. Thi sections show spherulites of yellow barrandite (n 1·64) and dahllite with coll phane and grains of quartz. X-ray powder photographs of the mixture sho lines of barrandite, dahllite, and quartz.

L. J. S.

Villiers (J. E. de). *Optical properties and crystallography of zoned pumpellyit from the Witwatersrand.* Amer. Min., 1941, vol. 26, pp. 237–246, 6 figs.

Pumpellyite [M.A. **3**–8; Min. Mag. **24**–529] as minute greenish-black needle in white vein-quartz is described from the City Deep mine, Johannesburg. Th monoclinic crystals (c/a 0·842, β 70°) are much zoned and twinned, and th optical characters show considerable variation: β 1·693–1·726, birefringenc 0·0016–0·0103, 2V 38–71°, optic axial plane $\perp$(010) with $r > v$ or $\parallel$ (010) wit $r < v$. A partial analysis by C. F. J. van der Walt gave SiO_2 36·9, Al_2O_3 27·7 Fe_2O_3 9·0, MgO 1·0, CaO 22·4, B_2O_3 0·6 = 97·6.

L. J. S.

Villiers (J. E. de), with a chemical analysis by Liebenberg (C. J.). *Th carbonate-apatites: francolite from the Richtersveld, South Africa.* Amer Journ. Sci., 1942, vol. 240, pp. 443–447.

Crystalline veins and crusts of francolite occur in much altered lava fro Annisfontein farm, Richtersveld, Namaqualand. Fibres show negative elonga

, α 1·614–1·617, β 1·627, γ 1·627–1·630, 2V 0–36°, d_4^{25} 3·116. Analysis gave $_5$ 35·01, Fe_2O_3 0·25, MgO 0·53, CaO 54·84, Na_2O 0·20, CO_2 4·43, F 5·60, 0·03, H_2O- 0·16, H_2O(105–300°) 0·62, H_2O(+300°) 0·89, insol. 0·10, total $_5$ O 2·36) = 100·30, agreeing with $Ca_{10}(P,C)_6F_3O_{23}$. Since the amount of rine is already in excess of that required for fluor-apatite, there cannot be acement of F by CO_3-groups; and CO_4-tetrahedra are assumed to replace -tetrahedra. [M.A. **7**–88, 351, 352.] L. J. S.

ALLER (Waldemar T.). *Bismoclite from Goldfield, Nevada.* Amer. Min., 1941, vol. 26, pp. 651–654, 1 fig.

rilliant pearly scales found in several mines in this district were described Ransome and Schaller in 1910 as bismite with the formula $Bi(OH)_3$. A new lysis, after deducting 34·81 % of quartz, gave Bi_2O_3 88·53, Cl 12·51, H_2O+ 3, H_2O- 0·20, agreeing with BiOCl. An X-ray powder photograph is identical : that of artificial BiOCl. The mineral is therefore bismoclite [Min. Mag. 55, 59]. The earlier goniometric measurements made on associated hexagonal tes are now interpreted as agreeing with iodyrite, with some new crystal-forms this species. L. J. S.

UGH (Frederick H.). *Occurrence of willemite.* Amer. Min., 1941, vol. 26, pp. 92–102.

howy specimens of willemite are known only from Franklin Furnace, New sey: at other localities the mineral is inconspicuous as small crystals. A list 30 known localities (including 7 new records) gives the form of the crystals l the associated minerals. At only three localities (Franklin Furnace; Oslo, rway; and Musartut, Greenland) is the mineral of high-temperature hypogene gin: other occurrences as small crystals of simple form (*a c e*) associated with ondary minerals appear to be supergene. One of the various suggestions in latter case is that it is a weathering product in arid regions with low water- le. The association of willemite with haematite and of hemimorphite with onite is commented upon. [Min. Mag. **21**–388.] L. J. S.

NSON (Ross A.) & PEARCE (D. W.). *Colorado cerite.* Amer. Min., 1941, vol. 26, pp. 110–120, 3 figs.

From an analysis of the 'cerite rock' the composition of the pure cerite is culated (differing considerably from the result given by Goddard and Glass A. **8**–157]) and the formula deduced as $2CaO.Al_2O_3.(Ce,La,Yt,\ \&c.)_2O_3.2SiO_2$, mina ($Al_2O_3$ 14·59 %) being regarded as an essential constituent, and water $_2O$ 0·07) unessential. Analysis of the allanite, occurring as a rim around the ite nodules, also differs markedly from that given by Goddard and Glass. tails are given of the spectrographic analysis for rare-earths in the cerite and anite. L. J. S.

AUB (B. M.). *Occurrence and origin of babingtonite and other minerals from Quabbin aqueduct, Massachusetts.* Amer. Min., 1941, vol. 26, pp. 121–129.

Shaft 10, near Hardwick, of the Quabbin aqueduct supplies the tenth locality Massachusetts [M.A. **5**–233, **6**–529, **7**–118, 164] of the 14 localities known for

babingtonite. Minute brilliant crystals of this, together with albite, epidot fluorite, apophyllite, calcite, gypsum, &c., occur in cavities in small veins granite. This association of minerals, especially of calcite, and the more freque occurrence of babingtonite in gabbro and diabase, suggest that the mineralizi solutions were derived from a basic magma. L. J. S.

Murdoch (Joseph). *Pyrostilpnite from Randsburg, California.* Amer. Min., 19 vol. 26, pp. 130–132, 1 fig.

Minute bladed crystals of pyrostilpnite (Ag_3SbS_3) occur, together with cerva tite and pyrargyrite, in cavities in massive miargyrite in the California Ra mine. The optics of the striated and twinned crystals suggest triclinic symmet rather than monoclinic. L. J. S.

Toothaker (Charles R.). *Calcite crystals with rhomboid tubes from Guanajua Mexico.* Amer. Min., 1941, vol. 26, pp. 733–735, 2 figs.

Elongated crystals of calcite showing the forms $e(01\bar{1}2)$, $f(02\bar{2}1)$, $\epsilon(01\bar{1}$ $M(40\bar{4}1)$, and $v(21\bar{3}1)$ each contain one small axial cavity, bounded by fa $r(10\bar{1}1)$, through which a hair or fine wire can be passed. F. A. B.

Ross (Clarence S.). *Origin and geometric form of chalcedony-filled spherulites fr Oregon.* Amer. Min., 1941, vol. 26, pp. 727–732, 8 figs.

Cross-sections of 'thunder-eggs' in rhyolitic tuffs from Oregon reveal cavit of geometric form which sometimes yield in plane section a five-pointed st Large cavities in welded tuffs expand under great compressive stress and devel rupture planes. The particular forms observed are explained and a possib geological history for the nodules is outlined. F. A. B.

Hutton (C. O.). *Fuchsite-bearing schists from Dead Horse Creek, Lake Wakati region, western Otago.* Trans. Roy. Soc. New Zealand, 1942, vol. 72, pp. 5 68, 3 figs.

Deep green fuchsite is an important constituent of fuchsite-oligoclase-schis and fuchsite-chlorite-schists interbedded with quartzo-felspathic schists; chro ite and redingtonite are accessory minerals. The properties of the fuchsite a α 1·5695, β 1·6040, γ 1·6115, 2V 37°, negative, pleochroism α robin's egg blu β very pale yellowish-green, γ bluish-green, $\alpha \geqslant \gamma > \beta$, sp. gr. 2·88; an analy by F. T. Seelye gives SiO_2 46·35, TiO_2 0·28, Al_2O_3 29·69, Cr_2O_3 4·60, Fe_2O_3 0·2 FeO 0·85, MnO 0·01, MgO 1·93, CaO trace, BaO 0·15, Na_2O 0·78, K_2O 10·5 H_2O+ 4·69, H_2O- 0·12, P_2O_5 0·01, V_2O_3 trace, S 0·05, F 0·04 = 100·31. classification of chrome-micas it is suggested that (*a*) the term mariposite shou be abandoned, (*b*) potash-micas with < 1 % Cr_2O_3 should be described as chro ferous muscovite, and (*c*) micas with > 1 % Cr_2O_3 should be described as fuc site, the last commonly characterized by α robin's egg blue, and $r > v$ stro The redingtonite is purple and earthy, and is soluble in water; prismatic crysta have straight extinction with positive elongation, α 1·475, γ 1·485; qualitati tests show it to be hydrous chromium sulphate with some iron. The fuchsit schists are a result of chromium metasomatism of quartzo-felspathic schis by emanations from deep-seated ultrabasic intrusions. [M.A. 8–21.]

C. F. D.